

A' cont.

(ii) at least one pan DR binding peptide selected from the formula

$R_1$ - $R_2$ - $R_3$ - $R_4$ - $R_5$ , wherein:

R<sub>1</sub> is an amino acid followed by alanine or lysine;

$R_2$  is selected from the group consisting of tyrosine, or phenylalanine;

R<sub>3</sub> is 3 or 4 amino acids, wherein each amino acid is independently selected from the group consisting of alanine, isoleucine, serine, glutamic acid and valine;

R<sub>4</sub> is selected from the group consisting of threonine-leucine-lysine, lysine-threonine, or tryptophan-threonine-leucine-lysine; and,

R<sub>5</sub> consists of 2 to 4 amino acids followed by an amino acid wherein each of the 2 to 4 amino acids is independently selected from the group consisting of alanine, serine, and valine.

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79. The polynucleotide of claim 78, wherein the polynucleotide is comprised by an expression vector.

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80. The polynucleotide of claim 78, wherein the fusion protein comprises multiple pan DR peptides.

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81. The polynucleotide of claim 78, wherein the fusion protein comprises a homopolymer of pan DR peptides.

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~~82.~~ The polynucleotide of claim 78, wherein the fusion protein comprises a heteropolymer of pan DR peptides.

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~~83.~~ The polynucleotide of claim 78, wherein the immunogenic peptide, native protein fragment or particle comprises a heteropolymer with repeating units.

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~~84.~~

~~84.~~ The polynucleotide of claim 78, wherein the immunogenic peptide, native protein fragment or particle comprises a T helper peptide.

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~~85.~~

85. The polynucleotide of claim 78, wherein the immunogenic peptide, native protein fragment or particle comprises an antibody-inducing peptide.

A' cont.

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~~86.~~

86. The polynucleotide of claim 78, wherein the immunogenic peptide, native protein fragment or particle comprises a CTL-inducing peptide.

Rule 12d

[illegible]

AI cont.

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87.

A method of synthesizing a fusion protein comprising at least one pan DR peptide and an immunogenic peptide, native protein fragment or particle, the method comprising,

(a) selecting a vector comprising a polynucleotide encoding a fusion protein, the fusion protein comprising,

(i) an immunogenic peptide, a native protein fragment or a particle, and,

(ii) at least one pan DR binding peptide selected from the formula  $R_1-R_2-R_3-R_4-R_5$ , wherein:

$R_1$  is an amino acid followed by alanine or lysine;

$R_2$  is selected from the group consisting of tyrosine, or phenylalanine;

$R_3$  is 3 or 4 amino acids, wherein each amino acid is independently selected from the group consisting of alanine, isoleucine, serine, glutamic acid and valine;

$R_4$  is selected from the group consisting of threonine-leucine-lysine, lysine-threonine, or tryptophan-threonine-leucine-lysine; and,

$R_5$  consists of 2 to 4 amino acids followed by an amino acid wherein each of the 2 to 4 amino acids is independently selected from the group consisting of alanine, serine, and valine;

(b) transforming a host cell with the vector; and,

(c) expressing the fusion protein in the host cell.

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88.

The method of claim 86, wherein the fusion protein comprises multiple pan DR peptides.

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The method of claim 87, wherein the fusion protein comprises a homopolymer of pan DR peptides.

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The method of claim 87, wherein the fusion protein comprises a heteropolymer of pan DR peptides.

Rule 126  
"146260"

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91. The method of claim 87, wherein the immunogenic peptide, native protein fragment or particle comprises a heteropolymer with repeating units.

~~32~~  
~~82.~~ The method of claim 87, wherein the immunogenic peptide, native protein fragment or particle comprises a T helper peptide.

~~93.~~ <sup>33</sup> The method of claim 87, wherein the immunogenic peptide, native protein fragment or particle comprises an antibody-inducing peptide.

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94. The method of claim 87, wherein the immunogenic peptide, native protein fragment or particle comprises a CTL-inducing peptide.

Rule 126

A' cont.

A' cont.

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~~95!~~

A fusion protein comprising,

- (i) an immunogenic peptide, a native protein fragment or a particle,

and,

- (ii) at least one pan DR binding peptide selected from the formula

R<sub>1</sub>-R<sub>2</sub>-R<sub>3</sub>-R<sub>4</sub>-R<sub>5</sub>, wherein:

**R<sub>1</sub> is an amino acid followed by alanine or lysine;**

R<sub>2</sub> is selected from the group consisting of tyrosine, or phenylalanine;

R<sub>3</sub> is 3 or 4 amino acids, wherein each amino acid is independently selected from the group consisting of alanine, isoleucine, serine, glutamic acid and valine;

R<sub>4</sub> is selected from the group consisting of threonine-leucine-lysine, lysine-threonine, or tryptophan-threonine-leucine-lysine; and,

R<sub>5</sub> consists of 2 to 4 amino acids followed by an amino acid wherein each of the 2 to 4 amino acids is independently selected from the group consisting of alanine, serine, and valine.

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~~96. The fusion protein of claim 95, wherein the fusion protein comprises~~  
~~OR peptides.~~

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~~97.~~

~~97.~~ The fusion protein of claim 95, wherein the fusion protein comprises a homopolymer of pan DR peptides.

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~~98.~~

~~98.~~ The fusion protein of claim 95, wherein the fusion protein comprises a heteropolymer of pan DR peptides.

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~~99.~~

99. The fusion protein of claim 95, wherein the immunogenic peptide, native protein fragment or particle comprises a heteropolymer with repeating units.

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~~100.~~

100. The fusion protein of claim 95, wherein the immunogenic peptide, native protein fragment or particle comprises a T helper peptide.

$\frac{41}{101}$

~~101.~~ The fusion protein of claim 95, wherein the immunogenic peptide, native protein fragment or particle comprises an antibody-inducing peptide.

Alessandro Sette  
Application No.: Not assigned  
Page 7

PATENT

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102. The fusion protein of claim 95, wherein the immunogenic peptide,  
native protein fragment or particle comprises a CTL-inducing peptide.

Rule 126

[illegible]

A' cont.

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~~104.~~

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111. The method of claim 103, wherein the immunogenic peptide, native protein fragment or particle comprises a CTL-inducing peptide.

A' cont.

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~~112. A method of inducing an immune response in a human, the method~~  
~~producing of a composition of claim 95 into a human.~~

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~~113.~~ The method of claim 112, wherein the fusion protein comprises multiple  
les.

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~~114.~~ The method of claim 112, wherein the fusion protein comprises a  
of pan DR peptides.

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~~115.~~ The method of claim 112, wherein the fusion protein comprises a  
r of pan DR peptides.

56

116. The method of claim 112, wherein the native protein fragment or  
 117. comprises a heteropolymer with repeating units.

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~~117.~~ The method of claim 112, wherein the immunogenic peptide, native  
ent or particle comprises a T helper peptide.

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118. The method of claim 112, wherein the immunogenic peptide, native  
ent or particle comprises an antibody-inducing peptide.

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~~119.~~ The method of claim 112, wherein the immunogenic peptide, native  
ent or particle comprises a CTL-inducing peptide.

Rule 126

[illegible]



A' cont.

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~~120. A composition for eliciting an immune response to a T-cell and/or antibody-inducing peptide, the composition comprising multiple pan DR peptides linked to one or more T-cell and/or antibody-inducing peptide,~~

wherein the pan DR binding peptides are selected from the formula R<sub>1</sub>-R<sub>2</sub>-R<sub>3</sub>-R<sub>4</sub>-R<sub>5</sub>, wherein:

**R<sub>1</sub> is an amino acid followed by alanine or lysine;**

**R<sub>2</sub> is selected from the group consisting of tyrosine or phenylalanine;**

R<sub>3</sub> is 3 or 4 amino acids, wherein each amino acid is independently selected from the group consisting of alanine, isoleucine, serine, glutamic acid and valine;

R<sub>4</sub> is selected from the group consisting of threonine-leucine-lysine, lysine-threonine, or tryptophan-threonine-leucine-lysine; and,

R<sub>5</sub> consists of 2 to 4 amino acids followed by an amino acid wherein each of the 2 to 4 amino acids is independently selected from the group consisting of alanine, serine, and valine.

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~~121.~~ The composition of claim ~~120~~, wherein the composition comprises multiple pan DR peptides.

6362

~~122.~~ The composition of claim 120, wherein the composition comprises a homopolymer of pan DR peptides.

6463

~~123.~~ The composition of claim 120, wherein the composition comprises a heteropolymer of pan DR peptides.

6564

~~124.~~ The composition of claim 120, wherein the T-cell and/or antibody-inducing peptide comprises a heteropolymer with repeating units.

~~64~~ 64

~~125.~~ The composition of claim 120, wherein the T-cell and/or antibody-inducing peptide comprises a T helper peptide.

Rule 126

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